Amendments to the Claims

The following listing of the claims will replace all prior versions, and listings of the claims in the application:

Listing of Claims

1-35 Canceled

36. (Previously presented) A method for self-routing a plurality of real data packets through a $2^n x 2^n$ switch, the switch having 2^n external output ports labeled with 2^n distinct binary output addresses in the form of $b_1 b_2 ... b_n$, and is composed of a plurality of switching cells interconnected into a k-stage bit-permuting network which is characterized by ~~the~~ a guide $\gamma(l)$, $\gamma(2)$, ... , $\gamma(k)$ where γ is a mapping from the set {1, 2, ... , k} to the set {1, 2, ... , n}, wherein each of the switching cells is a sorting cell associated with the partial order "10 ('0-bound') < 00 ('idle') < 11 ('l-bound')", each of the real data packets arriving at a distinct external input port determining an active input port and being destined for a binary destination address $d_1 d_2 ... d_n$, the method comprising:

generating an idle packet as a stream of '0' bits at each of the non-active external input ports,

generating a routing tag $ld_{\gamma(1)} d_{\gamma(2)} ... d_{\gamma(k)}$ for each of the real data packets based on the guide of the network and the destination address of the packet,

generating a routing tag which is a string of k+1 '0' bits for each of the idle packets, and

routing the real data packets and the idle packets through the network by sorting the packets by the sorting cells of the network, wherein the sorting by each of the sorting cells is according to the associated partial order and is based upon the leading two bits, which are either '10' or '11' for a real data packet, or '00' for an idle packet, of the routing tag of each of the two packets arrived at each of the cells, and wherein the second leading bit is removed from the routing tag or rotated to the end of the routing tag of each of the packets before the packet exits from the j-th stage cell such that the leading two bits of the routing tag of each of the packets at each of the j-th stage cell, $l \leq j \leq k$, are always '$ld_{\gamma(j)}$' or '00'.

37. (Previously presented) The method as recited in claim 36, wherein the real data

packets are classified into 2^r priority classes, $r \geq l$, wherein each of the priority classes is coded in an r-bit string $p_1 \ldots p_r$, and the generating of a routing tag for each of the real data packets includes generating $ld_{\gamma(1)}p_1 \ldots p_r d_{\gamma(2)} \ldots d_{\gamma(k)}$ as the routing tag.

38. (Previously presented) The method as recited in claim 36, wherein the generating of a routing tag for each of the idle packets includes generating a string of k+r+1 '0' bits as the routing tag.

39. (Previously presented) The method as recited in claim 36, wherein each of the priority classes is coded in an r-bit string $p_1 \ldots p_r$, the generating of a routing tag for each of the real data packets includes generating $ld_{\gamma(i)}p_1 \ldots p_r d_{\gamma(2)} \ldots d_{\gamma(k)}$ as the routing tag, the sorting at each of the sorting cells of a concentrator based upon the two leading bits of the routing tag includes using the priority code $p_1 \ldots p_r$ as the tiebreaker, and processing the routing tag includes generating the routing tag such that the leading r+2 bits of the routing tag of each of the real data packets at each of the j-th super-stage concentrators, $l \leq j \leq k$, is '$1d_{\gamma(j)}p_1 \ldots p_r$'.

40. (Previously presented) The method as recited in claim 36, wherein the real data packets are classified into 2^r priority classes, $r \geq l$, wherein each of the priority classes is coded in an r-bit string $p_1 \ldots p_r$, the generating of a routing tag for each of the real data packets includes generating $ld_{\gamma(1)}p_1 \ldots p_r d_{\gamma(2)} \ldots d_{\gamma(k)}$ as the routing tag, the generating of a routing tag for each of the idle packets includes generating a string of k+r+1 '0' bits as the routing tag, the sorting at each of the sorting cells of the concentrator based upon the two leading bits of the routing tag includes using the priority code $p_1 \ldots p_r$ as the tiebreaker, and processing the routing tag includes removing the second leading bit from the routing tag or rotating the second leading bit to the end of the routing tag, and rotating the r-bit priority code $p_1 \ldots p_r$ to the position behind the next bit originally following the priority code in the routing tag such that the leading r+2 bits of the routing tag of each of the packets at each of the j-th super-stage concentrators, $l \leq j \leq k$, are always '$ld_{\gamma(j)}p_1 \ldots p_r$' or '00...0'.

41-42 Canceled.